Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Henderson the shipowner, and brought his wife back to Edinburgh, where their home became one of its intellectual centres. For many years of his later life, Sir John and Lady Murray, with their family of two boys and three girls, lived in a roomy house on the outskirts of Edinburgh, which he had christened "Challenger Lodge." It was characteristic of the man that his unfailing insight enabled him to established a most sympathetic relation with his children, and caused him to use original methods, based on great independence and liberty, to develop them into efficient and self reliant personalities.

Turning into his own avenue, on March 16, 1914, Murray's automobile skidded and capsized, killing him instantly. Such an end, always wished for by him, came as a shock to his friends in many lands, whose admiration for the naturalist was only exceeded by their love of a very human fellow-man.

G. R. Agassiz.

ANDREW HOWLAND RUSSELL (1846–1915)

Fellow in Class I, Section 4, 1892.

Andrew Howland Russell was born in Plymouth, Massachusetts, on the 24th of December, 1846. His father, Andrew Leach Russell, and his mother, Hannah White Davis, were both of the old Pilgrim stock. He was educated first in the public schools of Plymouth, then spend two or three years at Philips Exeter Academy. In 1865 he was one of the first class to enter the Massachusetts Institute of Technology, but did not complete the course because in 1867 he received an appointment to the Military Academy from which he was graduated fourth in his class in 1871.

He was then promoted to Second Lieutenant in the Third Cavalry, in 1876 to First Lieutenant of Ordnance, in 1888 to Captain, 1901 to Major, 1895 to Lieutenant Colonel, 1907 to Colonel. From July to November, 1898, he held a Volunteer Commission as Major and Chief Ordnance Officer; from 1901 to 1904, he was Chief Ordnance Officer of the Division of the Philippines with the rank of Lieutenant Colonel.

As a Cavalry Officer, in 1871–1872, he served with his regiment in Arizona and Nebraska; in 1873–1874 on the Wheeler Expedition for Surveys west of the 100th Meridian, in New Mexico, Colorado and

Arizona. In 1874–1876, at the Military Academy at West Point as instructor in Natural Philosophy, Astronomy, Ordnance Mineralogy and Geology.

As an Ordnance Officer, he served from time to time at Watertown, Rock Island, Benicia, Fort Union and Frankfort Arsenals, at Vancouver Ordnance Depot; as Inspector of Ordnance in Boston, Providence and St. Paul, as Chief Ordnance Officer of the Department of the Columbia and of the Philippines, and as Assistant to the Chief of Ordnance in Washington, D. C. At the Centennial Exposition of 1887–1888 at Cincinnati, he had charge of the War Department Exhibit, in that of 1892–1893 at Chicago, of the Ordnance Exhibit.

All of this service was in many respects congenial, and favorable to the natural bent of his disposition. His transfer to the Ordnance gave him a good opportunity to exercise his ingenuity; and there was scarcely a branch of the work of that department in which he did not suggest useful improvements, some of which were adopted by the government at the time, and others after their value had been demonstrated in action by the armies of foreign nations.

In 1875, while still a Lieutenant of Cavalry, he invented an hydraulic buffer for checking the recoil of a gun on its carriage, afterwards known throughout the world under the name of Vavasseur. Colonel Russell not only antidated Vavasseur in this matter, but appears to be the pioneer in the field of modern gun carriage recoil systems. He obtained patents at home and abroad for a great number of ingenious devices relating to guns and their auxiliary appliances, which make the artillery of to-day so much more effective than before.

But the object to which he devoted the most labor and study was the improvement of small arms. His ingenuity suggested devices by which one musket could be made to do the work of several. In 1876, he invented devices for loading and firing rapidly, and made wooden models to illustrate their action; but they found little favor with "practical" military men who regarded them as more curious than useful, and most objectionable from sound military considerations. Soon after, he met Capt. W. R. Livermore who showed him designs and models so nearly like his own that at Russell's suggestion they decided to combine their efforts.

In 1878, a Board was convened at Springfield to test Magazine Guns. By that time the prejudice against magazines was so far modified that many officers were willing to try them provided the magazine was reserved for the final charge. The Hotchkiss Gun operated by a bolt, and with a tubular magazine in the breech was most favored. Russell and Livermore presented to the Board a wooden model of their device as applied to a Hotchkiss Magazine, and at the same time, prepared drawings of their own devices which dispensed with the tube and had a fixed box magazine under the receiver of the gun. In each case the cartridges were placed side by side in the box magazine into which they could be loaded either singly or all together, by a single motion. Five or six cartridges were carried side by side in a clip for this purpose. The clips were to be carried in the belt or in the cartridge box. The inventors explained how, for the most rapid fire, the magazine could be replaced by a belt and the piece fired like a machine gun, and how the principles could be applied to guns of all calibres.

Edward W. Byrn, describing "The Progress of Invention in the Nineteenth Century," says,

"This idea was subsequently developed by Livermore and Russell in Patent No. 230, 823, August 3, 1880, and this feature, viewed in the light of the importance subsequently attained by the "clip" in the Mauser and Mannlicher guns, may be fairly considered the pioneer of this idea of grouping cartridges in made-up packets for bolt guns. Its great advantage is the large number of shot that may be fired in a short space of time without an excessive weight in the gun itself." "Before the United States Army Gun Board of 1882, Livermore and Russell submitted a completed gun for trial in which the magazine was placed at the side of the receiver, extending downward, and was arranged to be filled through a side gate at the top from a cartridge package or "clip" grasped in the hand, and applied to the mouth of the magazine for stripping the cartridges from the clip into the magazine. This system also contemplated the use of a clip with a central as well as with a side magazine."....

The gun with some changes was tested before the Army Board of 1892 and the Navy Board of 1895. When the inventors explained that they had fired sixty aimed shots from their musket in a minute, a member of one of the Boards said that that alone was enough to condemn it, as even with muzzle-loaders soldiers often exhausted their ammunition.

Russell and Livermore also invented guns with straight pulling bolts and with automatic action. The United States Government adopted the Clip System in the construction of the musket now in use, although not until many other nations following the lead of Germany had already adopted it.

General Bernhardi writing a few years ago upon how Germany makes war (p. 58) says:—

"With the adoption of small calibre and clip-magazine, as well as with the introduction of smokeless powder, and of pointed projectiles, the development seems to have reached a certain climax and to have come to a finish for the time being.... The character of fighting has altogether changed."

In 1908, having served over forty years he applied to be placed on the retired list. In approving his application, the Chief of Ordnance spoke in highest terms of his ability, good judgment and devotion to duty, especially while acting as Chief of Ordnance for several months, saying that his reports of the Ordnance Exhibits at the Cincinnati and Chicago Exhibitions had been valuable contributions to the service, and adding;—

"Colonel Russell has also a very substantial claim to the inception and first presentation of the modern clip system of loading magazine guns, almost universally applied to the small arms of to-day. The original gun, embodying this feature, presented by him and Col. W. R. Livermore, U. S. A. before the United States Magazine Gun Board of 1882 is in this office. Several other inventions of Col. Russell's have been embodied in Ordnance Constructions, but without pecuniary compensation to him. The Department and the Army are indebted to him for efficient services."

After retiring from active service he travelled in Europe for about a year and then moved back to Plymouth where he died on the 16th of June, 1915.

It was a bitter disappointment that his own country had not been the first to adopt his inventions; but on his death bed was gratified to realize that the great war waging in Europe had demonstrated beyond question the truth of the principles for which he had fought so long; that one nation after another had adopted the system of guns of which he was a recognized pioneer, that the effect of their fire was all that had been claimed, and that warfare had taken the form which had been predicted.

His name will long be remembered in the history of firearms and especially of their development during the past forty years.

W. R. LIVERMORE.